H. W. OSTER.

THREADING MACHINE.

APPLICATION FILED JUNE 1, 1908.

965,402.

Patented July 26, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

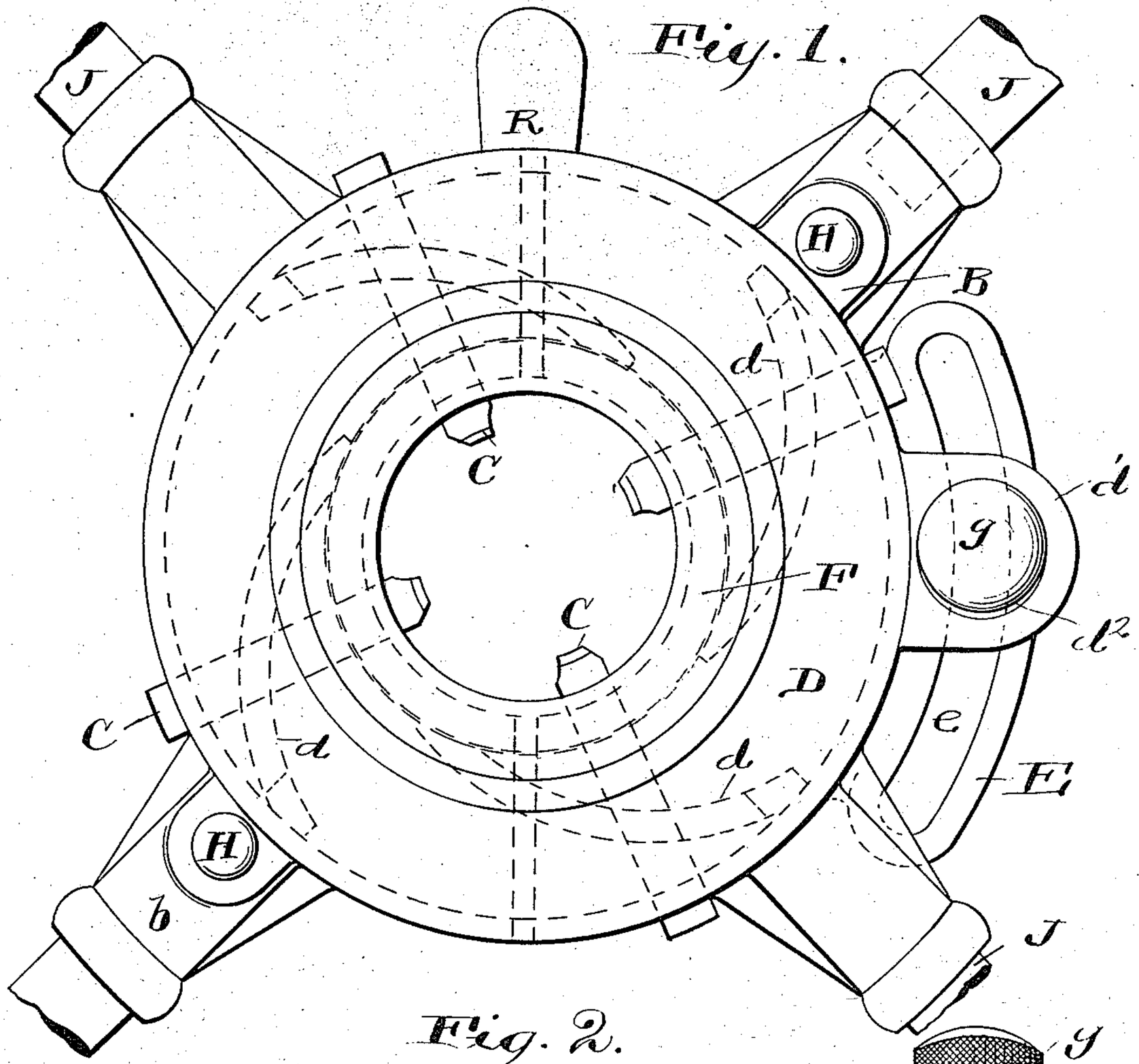
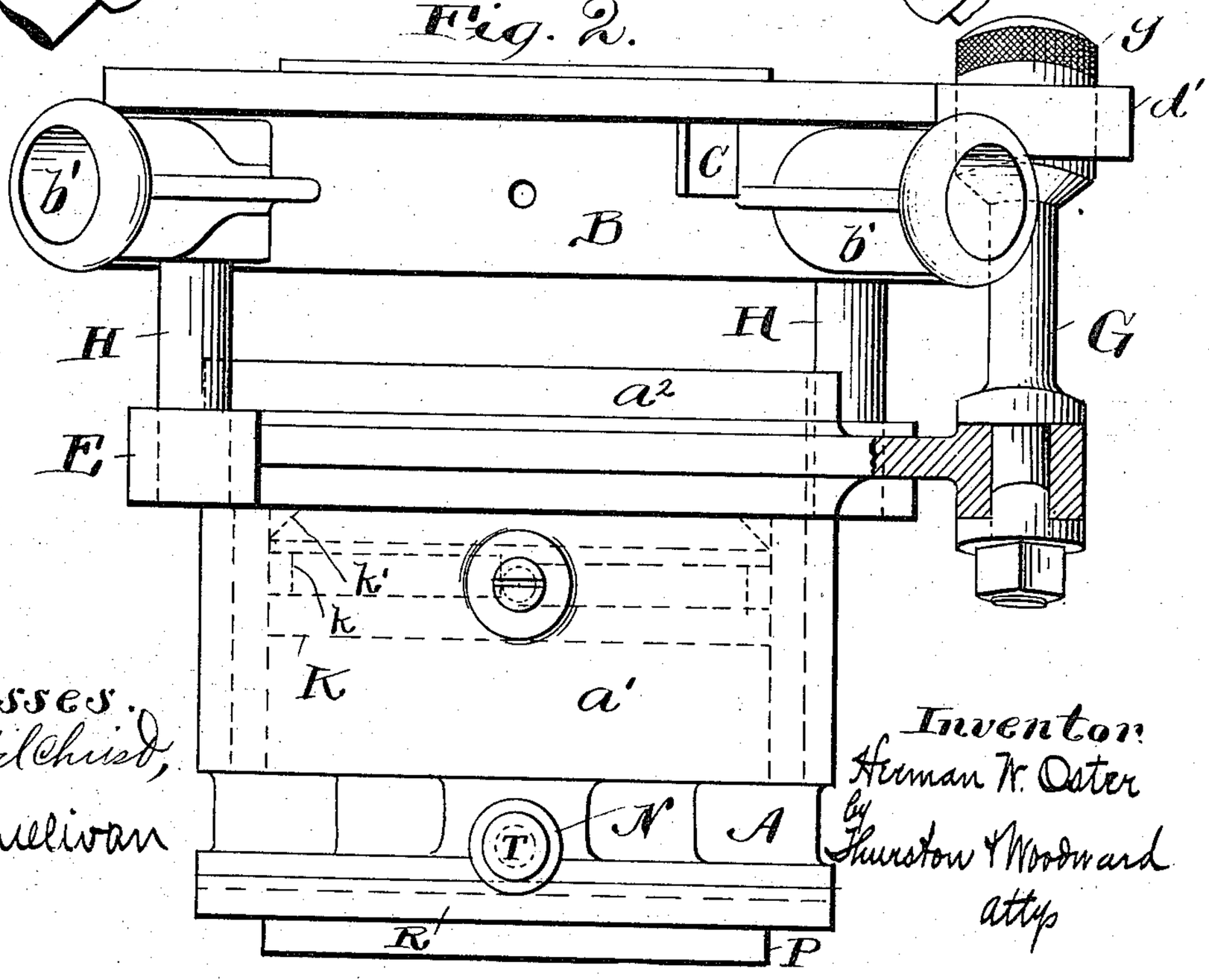


Fig. 2.



Witnesses.
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Fig. 3.

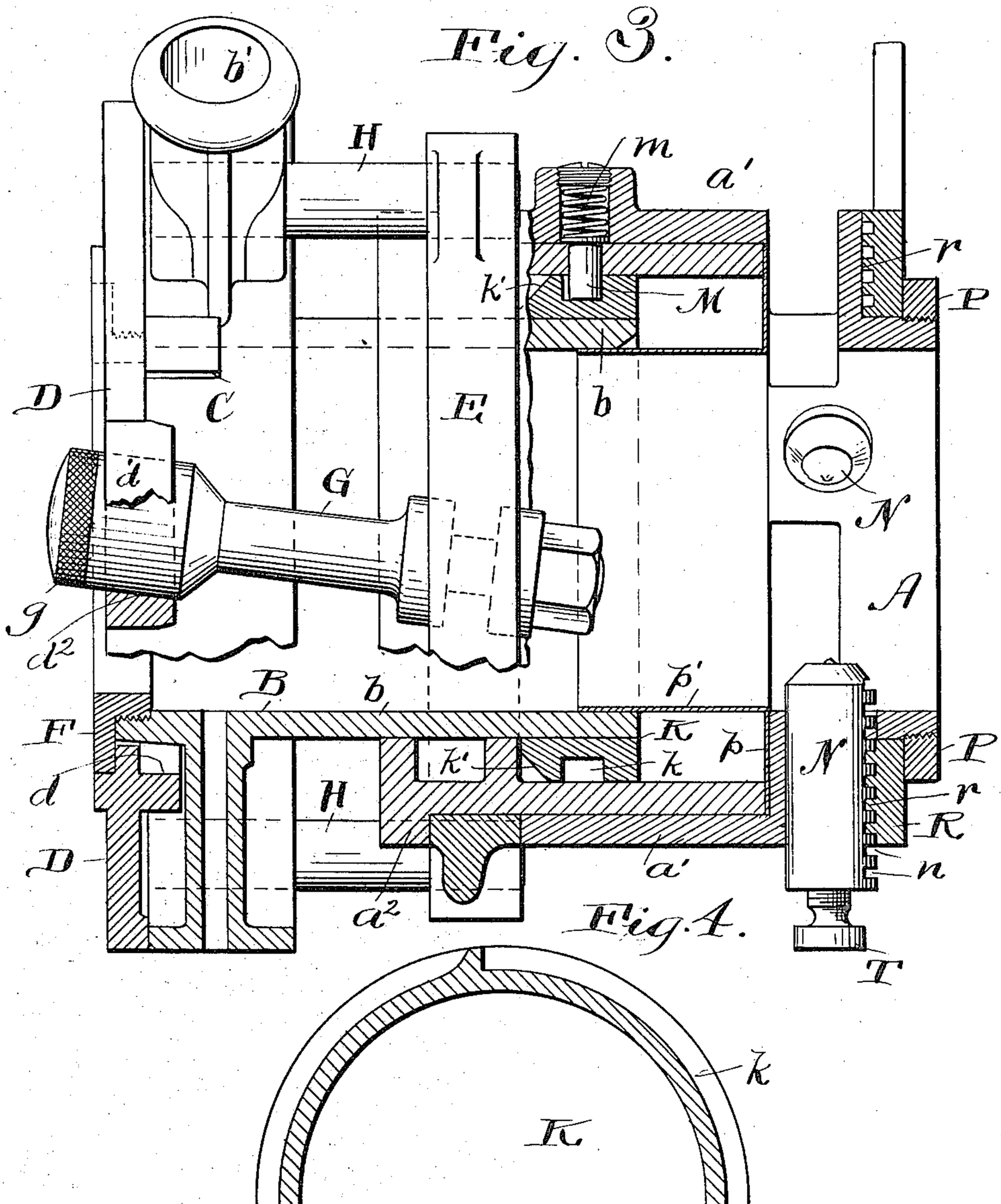

Fig. 4.

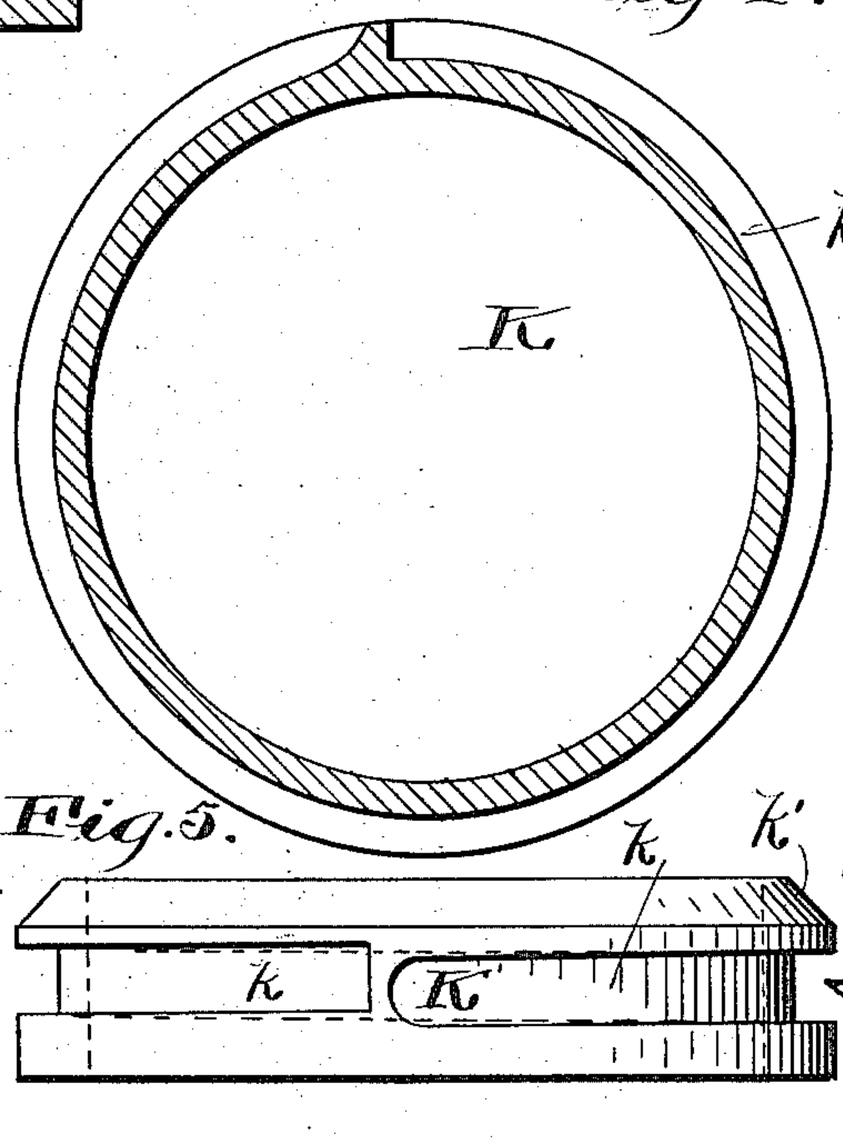

Fig. 5.

Witnesses.

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3 SHEETS—SHEET 3.

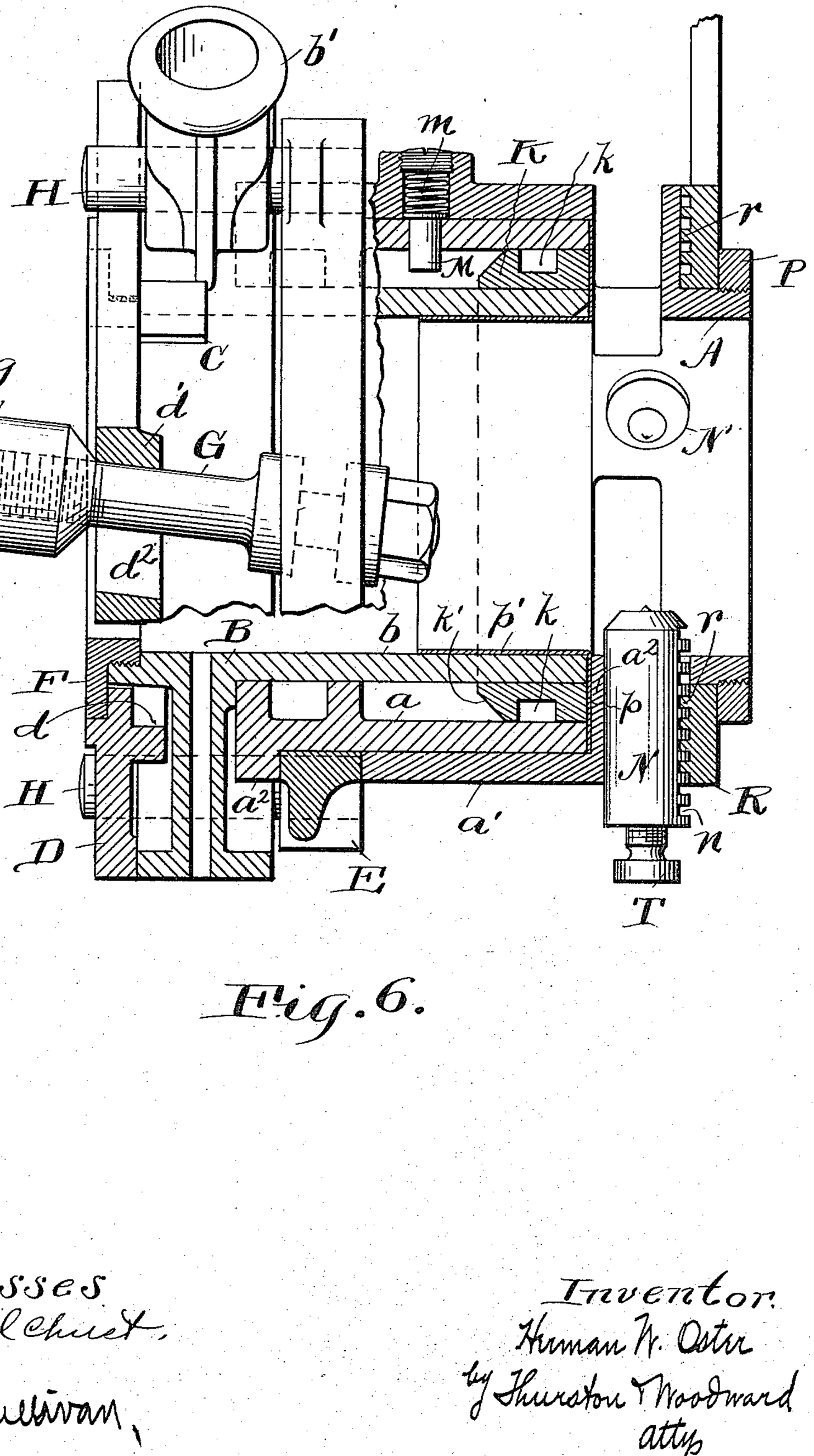

Fig. 6.

Witnesses
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UNITED STATES PATENT OFFICE.

HERMAN W. OSTER, OF CLEVELAND, OHIO, ASSIGNOR TO THE OSTER MANUFACTURING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

THREADING-MACHINE.

965,402. Specification of Letters Patent. Patented July 26, 1910.

Application filed June 1, 1908. Serial No. 436,078.

To all whom it may concern:

Be it known that I, HERMAN W. OSTER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Threading-Machines, of which the following is a full, clear, and exact description.

This invention pertains to devices for cutting tapered threads upon cylindrical pipes and bars. It is specifically an improvement upon the type of thread cutting devices which form the subject matter of my prior application No. 417,806, filed February 26, 1908.

The primary object of this invention is, however, to provide means by which, after a thread has been cut upon the work, the dies may be withdrawn from engagement therewith, and so permit the work to be removed from the device without having to turn the die-carrying part of the device backward.

Another object of the invention is to provide efficient means for securing the work to be threaded centrally within the device.

In the drawing, Figure 1 is an end view of a thread cutting device embodying the invention. Fig. 2 is a side elevation thereof broken away at one point and there shown in section. Fig. 3 is a side elevation largely in section showing the position of the parts when the cutting of a thread is commenced. Fig. 4 is a sectional view of the lead ring; Fig. 5 is a side elevation of that ring; and Fig. 6 is a view similar to Fig. 3, but showing the position of the parts after the threads have been cut and the dies withdrawn from engagement with the work.

Referring to the parts by letters, A represents the tubular work holder which is preferably made of two parts, a, a', rigidly fixed one upon the other. Upon the part a is an annular flange a^2 between which and the end of the part a' an annular groove is formed in which the ring E is rotatably mounted, but is held against endwise movement.

B represents the tubular die carrier which has a long cylindrical portion b which is rotatably mounted in the member A. The dies C are movable radially in guide ways in the end of the member B. A cam plate D is rotatably mounted upon the member B, and is held thereon by a flanged ring F which screws into the end of the member B. This cam plate has the usual cam ribs d on its inner face which engage in notches in the dies in the usual way, whereby, as this cam plate is turned, the dies are simultaneously and equally moved in or out in their guide ways. This cam plate is provided with an outwardly extended portion d' having in it a hole d^2.

An arm G is fixed in an arcual slot e to the ring E, and extends therefrom toward the end of the device at an inclination to the axis of said ring, as shown. This arm passes through the hole d^2 in the overhanging part of the cam plate, and a cylindrical nut g which loosely fits this hole is screwed onto this bar. Pins H secured to the ring E, are parallel with the axis of the device, and pass loosely through holes in the member B.

A ring K is fixed to the member B lying in a recess between said member and the part a of the member A. In the periphery of this ring is a groove k, cut spirally with the same pitch as the pitch of the threads on the dies C. A radially extended spring actuated plunger M is mounted in the member A, and is adapted to be moved radially inward by its spring m, into the groove k.

In the member A, near the end thereof are three, more or less, radially moving clamping bars N having spiral grooves n in their outer faces, which are engaged by spiral ribs r on a cam plate R rotatably mounted upon the member A, and thereon held by a lock ring P. A set screw T screws longitudinally through each of the bars N, and the points of said screws, which may be adjusted by turning the screws one way or the other, engage with the work.

Now, to use this device, the cylindrical pipe or bar to be threaded is passed into the device from the right end thereof, where the parts are in the position shown in Fig. 3, until its end engages with the dies C. The cam plate D has been turned to properly set the dies; and the bar G has been adjusted in the slot e in the ring E, so that the cylindrical nut G, by its engagement with the cam plate in the hole d^2 therein, will hold the cam plate and consequently the dies in the proper position for beginning the

cutting of the threads. When the parts are in the position shown the plunger M will be engaging in the groove *k* in the ring K. The cam plate R will then be turned to cause the clamping bars N to firmly clamp the work. The member B is now turned,—and this may be done by handles J screwed into sockets *h'* formed upon the member B. As the member B is so turned, it will be drawn into the member A by the action of the plunger M upon the spiral groove *k* in the ring K. In other words, this ring K and plunger M serve the purpose of a lead screw when the cutting of the thread is first begun. When, however, one revolution of member B has been effected the plunger will come to the end of groove *k*, which end is inclined outwardly, whereby the plunger is pushed out of the groove, and thereafter engages for a time with the outer surface of said ring, but it has no effect whatever in causing endwise movement of the member B. By this one revolution of member B, however, during which time said member B is being drawn inward, the dies have taken hold of the work, and thereafter will make their own lead as they cut the thread. The member B will therefore be gradually drawn into the member A by the said action of the dies. The member B and the ring E will rotate in unison because of the pins H carried by the ring passing through holes in the member B. As member B is thus drawn inward, it carries the cam plate with it, and this cam plate will slide along the nut *g* and be gradually turned in the direction which moves the dies slowly outwardly, and thereby they will cut a tapered thread upon the work. When a thread of sufficient length has been cut the cam plate will generally have passed beyond the nut *g* into the plane of the body of the bar G, or at least onto the lower tapered end of said nut. When the cam plate is no longer engaging with the nut,—and perhaps when it is embracing the tapered end thereof, the cam plate may be turned so as to withdraw the dies from the work. This being done, the work may be withdrawn from the device, and thereafter the member B, and cam plate may be moved endwise, without turning, so as to restore the parts to the position for again beginning to cut a thread. As member N and its ring K are moved outward in member A, the inclined face *k'* on ring K will engage the plunger M and push it outward and hold it out until the groove *k* comes into the range of said plunger, whereupon the plunger will snap into this groove. As the parts move into this position the cam plate, by engagement with the taper ended nut *g* will be turned to the proper position to set the dies for beginning the cutting of a new thread. The enlarged part of the guide bar G is made in the form of an adjustable nut in order that the device may be adjusted to throw off the dies at any desired point.

In order to prevent the chips produced by the dies from getting between the die carrier and work holder, and into the described lead devices, a cylindrical chip shield *p'* is provided. It is secured to the work holder by means of a flange *p* which is clamped between the lower end of the member *a*, and a shoulder a^2 on the member *a'*—and the shield fits the inner surface of the die carrier.

Having thus described my invention, I claim:

1. In a threading machine, a work holder, a die carrier which is rotatable and movable lengthwise relative to said work holder, a die carried by said die holder, and a cam plate having an overhanging edge carried by and adapted to turn upon said die carrier and to control the position of the die, a ring rotatable upon the work holder but incapable of longitudinal movement thereon, means compelling this ring and die carrier to rotate in unison, an inclined arm secured to said ring and passing through a hole in the over-hanging edge of said cam plate, said arm being enlarged in that part which normally plays in the hole in said cam plate, said enlarged part having a tapered inner end.

2. In a threading machine, a work holder, a die carrier which is rotatable and movable lengthwise relative to said work holder, a die carried by said die holder, and a cam plate having an overhanging edge carried by and adapted to turn upon said die carrier and to control the position of the die, a ring rotatable upon the work holder but incapable of longitudinal movement thereon, means compelling this ring and die carrier to rotate in unison, an inclined arm secured to said ring and passing through a hole in the over-hanging edge of said cam plate, said arm being provided with a cylindrical enlargement secured for longitudinal adjustment on said arm and adapted to play in the hole in said cam plate.

3. In a thread cutter, the combination of a tubular work holder, a tubular die carrier rotatably mounted upon the work holder and capable of longitudinal movement relative thereto,—the die carrier having an external flange within the work holder, and said flange having in its periphery a spiral groove with an inclined terminal, and having also a tapered end, with a movable device carried by the work holder, and a spring for forcing the same inward whereby it will engage with the tapered end of said flange or with the periphery of the flange or with the spiral groove therein according to the relative positions of the die carrier and work holder.

4. In a thread cutter, a work holder comprising two concentric telescoping parts, the outer member having an inwardly turned flange at one end, a tubular chip shield concentric with the work holder and having an outwardly extended flange which is clamped between the end of the inner member of the work holder and the inwardly turned flange on the outer member thereof, combined with a die carrier having a tubular portion which is rotatably mounted in the work holder, with its end embracing the cylindrical portion of the chip shield.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

HERMAN W. OSTER.

Witnesses:
E. B. GILCHRIST,
H. R. SULLIVAN.